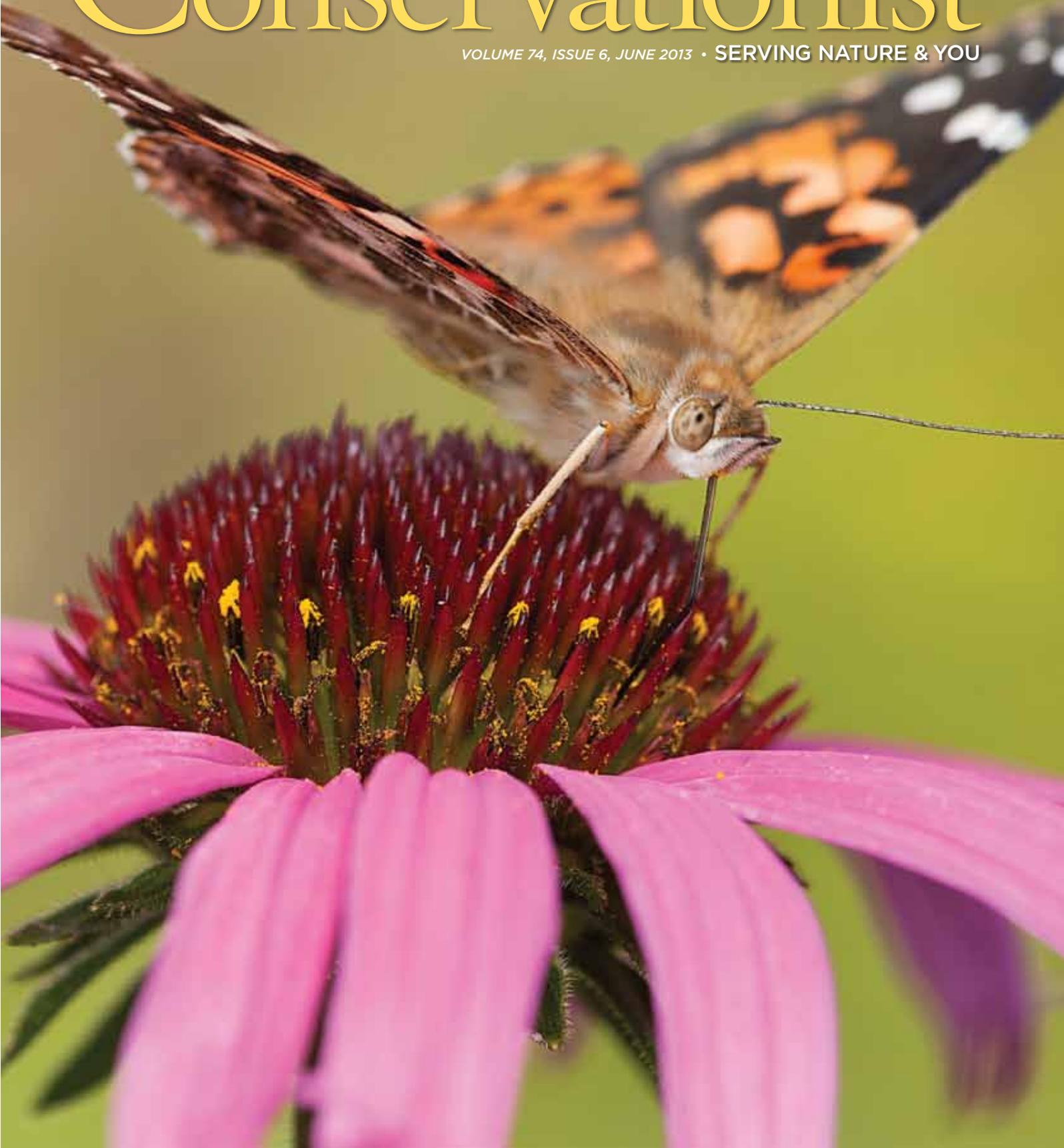


# MISSOURI. Conservationist

VOLUME 74, ISSUE 6, JUNE 2013 • SERVING NATURE & YOU



## [NOTE TO OUR READERS]

# Conservationists United

My cherry wood turkey box call is a reminder of how important it is to listen to Missouri citizens and collaborate with them on conservation. A dying gentleman gave me the box call during our last visit about

Missouri's outdoors. My friend hand-made the call from a dining table that his grandparents used around the time of the Civil War. We used to visit while he waited on his grandson to return from hunting on Monkey Mountain Conservation Area.

It's been my opportunity and privilege to listen to Missouri citizens and work with them for the past 36 years, on many different conservation topics. There are also many types of conservationists. I occasionally hear that hunters and anglers aren't conservationists because they harvest fish and game. Nothing could be further from the truth. My friend was a long-time conservationist who, as a hunter, abided by wildlife laws and regulations, supported many conservation programs, and passed on his conservation heritage to his son and grandson.

Hunters and anglers were some of the first people to take action when fish and wildlife species were declining across our great nation, and we should recognize how they have helped guard our resources over the years. Hunters, anglers, boat owners, and recreational shooters have quietly and diligently provided financial support to wildlife management nationwide through excise taxes on their equipment that funds the Wildlife Restoration Fund and the Sport Fish Restoration Fund. Over the past 75 years they have contributed more than 14 billion dollars to wildlife conservation. In addition, sportsmen have contributed billions more in permit fees and support of nongovernment conservation organizations such as Ducks Unlimited, National Wild Turkey Federation, Audubon, Pheasants Forever, Quail and Upland Wildlife Forever, Missouri Prairie Foundation, and many more.

Being a conservationist is definitely not limited to hunters and anglers. I've met wonderful conservation-minded people across Missouri who engage in the outdoors in other ways. Bird watchers, hikers, and sporting-dog enthusiasts are just a few examples of conservation supporters. Conservation in Missouri is a mindset, a lifestyle, part of Missouri's culture, and, more importantly, a choice. So who is a Conservationist?

A Conservationist:

- Is action oriented — pursues opportunities to better natural resources.



- Has a respect for the land — a land ethic to preserve and protect.
- Has high ethical standards.
- Understands and supports the North American Model of Conservation: [joomla.wildlife.org/index.php?id=171&option=com\\_content&task=view](http://joomla.wildlife.org/index.php?id=171&option=com_content&task=view)

Conservationists are people I enjoy spending time with and getting to know better. They share a passion for improving Missouri's outdoors and leaving both the land and natural resources in better shape for future generations. Conservationists are men and women who are at ease over a campfire, who aren't shy about sharing their excitement for the outdoors, who are a cross section of society culturally and economically, and who care deeply enough about Missouri's natural resources to take decisive action.

So what are today's challenges for Missouri Conservationists? Water quality and quantity will continue to grow as a challenge, invasive species such as silver carp, diseases such as Chronic Wasting Disease in whitetail deer and White Nose Syndrome in bats, and habitat loss are all challenges today and into the future. Specialization and fragmentation of the outdoor community is a unique challenge today due to many specific conservation organizations and interests. There's nothing wrong with being specialized, we just shouldn't fight each other and should pull together on major conservation agendas and issues.

Missouri is fortunate to have many quiet conservationists. Many landowners simply go about the business of improving the land for the next generation. Many citizens support conservation initiatives and causes with their time, energy, and resources. Though quiet by nature, these folks will stand staunchly against anything that lessens their quality of life in Missouri due to a quality conservation ethic. No matter our outdoor passion, we should stand together on major conservation issues and keep Missouri as a conservation leader for our children and future generations.

Tim D. Ripperger, deputy director

## FEATURES

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by Neil Bass and Mark Boone

Conserving fish and wildlife habitat along America's longest river

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by Gladys J. Richter

Hardy enough for roadside displays, yet delicate-toned enough to be included in a backyard palette of pastels, *Echinacea* are an outstanding addition to any native garden design.

### 24 **Fish**

by Bernadette Dryden

A world of good eatin' in the state's waters

Cover: A painted lady butterfly feeds on a purple coneflower, by Noppadol Paothong. Read more about the five Missouri *Echinacea* coneflower species beginning on Page 16.

📷 180mm lens • f/7.1 • 1/160 sec • ISO 200

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## WHAT IS IT?

Our photographers have been busy exploring the intricacies of the Missouri outdoors. See if you can guess this month's natural wonder. The answer is revealed on Page 7.



**FROM NEAR AND FAR**

I have enjoyed the *Conservationist* since I was a young boy, but never more than the last two months. I am currently serving as a science and technology advisor for the U.S. Army in Afghanistan, and there is not a lot of nature to be seen where I'm stationed. Seeing the beautiful photographs of Missouri's natural resources sure makes me thankful for what we have.

*Kenny Light, P.E., Rolla*

*Ombudsman's Note: Thank you for your service and for taking the time to send us your comments. We are delighted that the magazine is appreciated by Missourians who are far from home. As we begin to enjoy springtime here, we should remember those who are serving us in distant lands. We hope that you will*

*soon be back safely to enjoy Missouri's outdoors in person. —Tim Smith*

I love MDC! E-Permits are SO easy to buy, your managed ranges are awesome, the staff and volunteers are great, and I love the *Conservationist* — awesome pictures! I am proud to live in Missouri because of your work.

*Jon Kimerle, via Internet*

**HEAVENLY RESPONSE**

I was excited to see the feature on the upper Jacks Fork River in the April issue [*To Heaven and Back on the Upper Jacks Fork*]. The upper "Jacks" has always been my favorite float stream. I used to paddle/camp it along with my brother and some friends during the off-season months, November until April, when the "river dorks" were nowhere to be seen or heard!

Now I live in the heart of "Canoe Country" near the Boundary Waters Canoe Area Wilderness of northeast Minnesota. The upper Jacks Fork is still my favorite place to wet a paddle.

*Doug Turner, Grand Marais, Minn.*

Thank you for Brett Dufur's beautifully written article about floating the Jacks Fork River. Phrases like "geologic jambalaya" and descriptions of birdsong, flowers, and the work of tiny drops of water on rock made me feel the magic of the place and imagine what it was like.

*Mary Lee, Smithville*

Just have to say how happy I was to see you all thoroughly enjoyed the jewel known as the Jacks Fork. It is without a doubt one of, if not the, most favorite place for my family and myself. Our two boys (4 and 7) have accumulated together over 700 miles in a canoe on Ozark rivers and a great deal of them have been on the Jacks Fork. Thanks for sharing your experience in the *Conservationist*, for we can truly relate to the power of that place.

*Jody Miles*

*Co-Executive Director, Earth's Classroom, Rosebud,*

**WILD RECIPES**

When I was a child, the magazine had recipes for wild game and fish. Why were they removed?

*Keith Stevenson, Hannibal*

*Editors' Note: The magazine has gone through many redesigns over the years, and during those makeovers we try to adjust our content to better fit our readers' needs and requests, as well as our Department's goals. Due to limited space, sometimes segments are removed. We really enjoy wild game recipes, too, so we understand your disappointment. While we do run them occasionally as part of other articles (see Page 24), we are not able to make them a regular item at this time. However, you can still access many of our wild game recipes online on our "Cooking" page at [mdc.mo.gov/node/3500](http://mdc.mo.gov/node/3500) and in publications available through our Nature Shop (at select centers and online at [mdcnatureshop.com](http://mdcnatureshop.com)).*



**Reader Photo**

**PHOTO BALM**

Eltjen Flikkema, of Springfield, captured this photo of a single ox-eye flower in a field of wild bergamot during a walk at the Missouri Department of Conservation's Springfield Nature Center. "After retirement, I resolved to increase my exercise regimen by walking frequently at the nature center," said Flikkema. He enjoys taking pictures of anything interesting, beautiful, unusual, or intriguing. "In this picture, I found the solitary yellow flower in the midst of the purple flowers most interesting," said Flikkema. "When I walked through the area a day later, it was gone, but I had it in my collection!"



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## MDC Online

Discover more about nature and the outdoors through these sites.

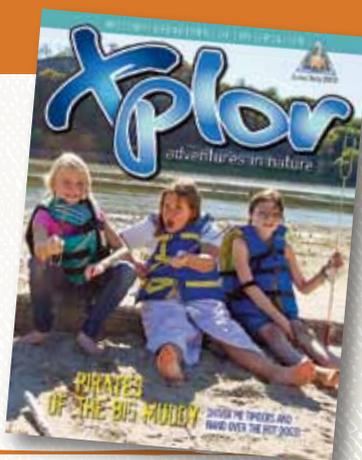
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# HUNTING AND FISHING CALENDAR

## FISHING

	OPEN	CLOSE
Black Bass from Ozark Streams	5/25/13	2/28/14
Bullfrogs and Green Frogs	Sunset	Midnight
	6/30/13	10/31/13
Nongame Fish Gigging	9/15/13	1/31/14
Paddlefish on the Mississippi River	9/15/13	12/15/13
Trout Parks	3/01/13	10/31/13

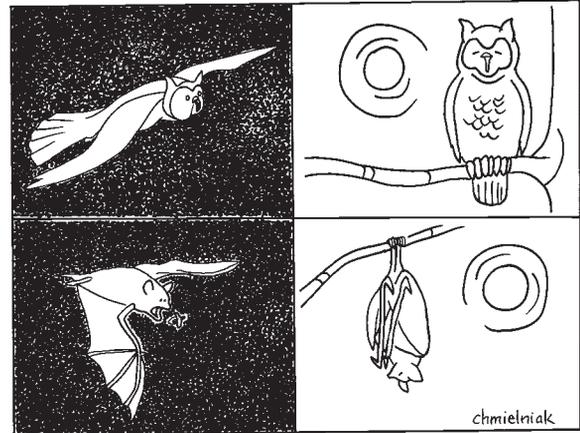
## HUNTING

	OPEN	CLOSE
Coyote	5/06/13	3/31/14
Deer		
Archery	9/15/13	11/15/13
	11/27/13	1/15/14
Firearms		
Urban	10/11/13	10/14/13
Early youth	11/02/13	11/03/13
November	11/16/13	11/26/13
Antlerless (open areas only)	11/27/13	12/08/13
Alternative Methods	12/21/13	12/31/13
Late Youth	1/04/14	1/05/14
Furbearers	1/15/13	1/31/14
Groundhog	5/06/13	12/15/13
Pheasants		
Youth (North Zone Only)	10/26/13	10/27/13
North Zone	11/01/13	1/15/14
Southeast Zone	12/01/13	12/12/13
Quail		
Youth	10/26/13	10/27/13
Regular	11/01/13	1/15/14
Rabbit	10/01/13	2/15/14
Squirrels	5/25/13	2/15/14
Turkey		
Archery	9/15/13	11/15/13
	11/27/13	1/15/14
Firearms		
Fall	10/01/13	10/31/13
Waterfowl	please see the <i>Waterfowl Hunting Digest</i> or see <a href="http://mdc.mo.gov/node/3830">mdc.mo.gov/node/3830</a>	

## TRAPPING

	OPEN	CLOSE
Beaver and Nutria	11/15/13	3/31/14
Furbearers	11/15/13	1/31/14
Otters and Muskrats	11/15/13	2/20/14

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code* and the current summaries of *Missouri Hunting and Trapping Regulations* and *Missouri Fishing Regulations*, *The Spring Turkey Hunting Regulations and Information*, *the Fall Deer and Turkey Hunting Regulations and Information*, *the Waterfowl Hunting Digest*, and *the Migratory Bird Hunting Digest*. For more information visit [mdc.mo.gov/node/130](http://mdc.mo.gov/node/130) or permit vendors.



Nocturnal animals are *light* sleepers.

## Agent Notes

### The Gift of Fishing



NOT LONG AGO, I was working on the Niangua River, and I pulled my boat up to a father and son who were fishing from their canoe. I could not ignore their huge smiles. Before I could even introduce myself, the son loudly said to me, "You just missed it. I just caught my first fish!"

I was reminded of how my father introduced me to the outdoors. During trips floating and fishing the clear Ozark streams of southern Missouri, he taught me how to navigate a canoe, cast a fishing rod, and identify different fish. Those trips together influenced my future profession as a conservation agent. June is a great month to go fishing. During Free Fishing Days June 8–9, anyone can fish in Missouri without buying a fishing permit, trout stamp, or trout park daily tag. Normal regulations, such as limits on size and number of fish an angler can keep, remain in effect during Free Fishing Days. Some private fishing areas still require fees on free fishing days, and trespass laws remain in effect on private property. Public fishing areas are available in every county in Missouri. Contact your local MDC office for Free Fishing Days near you, or visit [mdc.mo.gov/node/3675](http://mdc.mo.gov/node/3675).

Whether you spend your time at a city lake, a large reservoir, or floating one of Missouri's rivers, take a first-time angler with you. With a little luck, you'll leave with smiles on your faces. You may change a life forever.

*Matt Hitchings is the conservation agent in Dallas County. If you would like to contact the agent for your county, phone your regional conservation office listed on Page 3.*

# ASK THE Ombudsman



Eyed click beetle

**Q.** Can you tell me what kind of beetle I found in my yard? It is black with white specks and has two unusually large eyes or spots on the top of it.

A. It sounds like you found the eyed click beetle (*Alaus oculatus*), an unusual and interesting insect. They do catch one's attention because of their size (1.5 – 1.75 inches long) and their prominent eye-like markings. The two white-rimmed black spots on the thorax are actually false eyespots that are intended to deter predators. Located on the head, in front of the thorax, the real eyes are much smaller and less intimidating. The neatest thing about the click beetle is the "click." As with some other beetles, its reaction when threatened is to drop to the ground and lay motionless on its back. But this beetle can arch its back and then snap it back, which makes an

audible clicking sound and propels it several inches into the air. The adult beetles may feed on plant juices but the larval stage, known as wireworms, feed on the larvae of other beetles that feed on hardwood trees.

**Q.** I killed a spike buck that had a straight spike on one side and a curved or spiraling spike on the other side. Do you know what might have caused the one antler to be curved?

A. Antler shape and size are determined by a number of factors such as genetics, nutrition, and the age of the deer. Usually the two opposing antlers on a

rack are similar to each other, making a symmetric rack. The areas on a deer's skull that produce antler growth are called pedicles. Injuries and/or infection to one pedicle can cause that antler to grow differently. Damaged pedicles are more common in older bucks where head injuries result from fighting with other bucks. Additional skeletal injuries or poor body condition may affect antler growth. I cannot say with certainty what factors were involved in producing the asymmetric antlers on your deer.

**Q.** A cardinal keeps pecking on the windows of my house. Why is it doing that, and how can I stop it?

A. Your question is one that I receive frequently. During the breeding season, birds become territorial as they try to defend their breeding and nesting territory from other birds. The cardinal, usually a male, is seeing his own reflection in the glass and thinks that it is another male cardinal. He's trying to run that "other" bird out of his territory.

To discourage the behavior, you need to do something to the glass to break up the reflection. Smearing some liquid soap (dish soap) on the glass will often do the trick. Or you could cover that part of the glass with something nonreflective. Defensive birds will also attack mirrors and shiny chrome on vehicles. The annoying behavior usually only occurs in the spring or early summer because the instinct to defend a territory diminishes as the nestlings are fledged.

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*Ombudsman Tim Smith will respond to your questions, suggestions, or complaints concerning the Conservation Department.*  
Address: PO Box 180, Jefferson City, 65102-0180  
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Email: Ombudsman@mdc.mo.gov



## Top Trail State

Missouri has been named the “Best Trails State” by American Trails, a national, nonprofit organization. American Trails announced the award at the International Trails Symposium in Arizona in April. The award is presented every two years to the state with the most-improved trails. The announcement came in time for the National Trails Day celebration June 1.

The Conservation Department maintains more than 700 miles of foot, bicycle, and equestrian trails on 136 conservation areas and 10 nature and education centers statewide. You can find a trail near you by using the conservation-area database, [mdc.mo.gov/node/3392](http://mdc.mo.gov/node/3392).

Missouri’s world-class trails system is one way that conservation pays, both by enriching Missourians’ lives and by attracting tourist dollars.

## Missouri Gets \$22.4 Million in Federal Excise Tax

The U.S. Fish and Wildlife Service recently announced Fiscal Year 2013 apportionments of federal aid to wildlife and sport fish restoration funds totaling \$882 million. Missouri’s share is \$14.1 million for wildlife and \$8.3 million for fisheries.

The Federal Aid in Wildlife Restoration Act of 1937 (also known as the Pittman–Robertson Act) is funded by excise taxes on sporting arms and ammunition, pistols, and certain archery equipment. The Federal Aid in Sport Fish Restoration Act of 1951 (aka the Dingell–Johnson Act) is funded by excise taxes on fishing equipment. The Sport Fish Restoration Fund is augmented by the Wallop–Breaux Act of 1984, from excise taxes on motor-boat fuels.

Since these two programs’ inception, Missouri has received approximately \$370 million for fish- and wildlife-related activities. The funds were established at the urging of hunters and anglers.

“P-R” and “D-J” money supports a wide range of conservation programs, including boat accesses, hatchery improvements, land acquisition, research, population monitoring, and habitat management. The U.S. Fish and Wildlife Service divides these funds among states based on geographic size and the number of hunting and fishing permits sold. States must match federal funds with at least 25 percent of project costs. For every dollar Missouri spends for P-R or D-J projects, hunters and anglers receive \$11 in return, and the state’s economy gets a \$22 boost.

## Free Fishing Days

If you don’t believe the best things in life are free, you haven’t taken advantage of Free Fishing Days in Missouri. The Conservation Department suspends resident and nonresident fishing permit requirements on the Saturday and Sunday after the first Monday in June each year. This year’s dates are June 8 and 9.

The idea is to encourage people to explore the state’s fishing opportunities without having to purchase permits or daily tags at trout parks. The Conservation Department makes fishing easy by providing more than 900 fishing lakes, ponds, and stream accesses. Many offer disabled-accessible facilities. For more information about places

to fish, visit [mdc.mo.gov/node/2478](http://mdc.mo.gov/node/2478) or contact the nearest MDC office.

Other fishing regulations, such as limits on size and number of fish, remain in effect during Free Fishing Days. Regulations are outlined in the *2012 Summary of Missouri Fishing Regulations*, which is available wherever fishing permits are sold, or online at [mdc.mo.gov/node/6108](http://mdc.mo.gov/node/6108). Special permits may still be required at county, city, and private fishing areas.

### Reward Offered in Eagle Shootings

The Conservation Department and the U.S. Fish and Wildlife Service are investigating the shooting deaths of two bald eagles earlier this year. Tipsters with information that leads to convictions in those cases can get cash rewards.

A citizen tip in January led Conservation Agent Vincent Crawford to one of the eagles. He found the bird dead of a gunshot wound near Panther Creek in Caldwell County. In February, a rider on horseback found a dead eagle on the



Jack Rabbit Bend Trail at Smithville Lake and reported it to Clay County Conservation Agent Daniel Schepis.

Both cases are under joint investigation by the Conservation Department and the U.S. Fish and Wildlife Service, since eagles and other

birds of prey are protected by federal law. Cash rewards for tips leading to convictions are available through Missouri's Operation Game Thief Hotline. Tips can be made anonymously by calling 800-392-1111.

Under the Bald and Golden Eagle Protection Act, the unlawful shooting of eagles is punishable by a fine of up to \$100,000 and not more than one year incarceration or both.

### Spring Turkey Harvest

Hunters shot 42,220 turkeys during Missouri's regular spring turkey season. That is an increase of 1,773, or 4 percent, from 2012.

Top harvest counties during the regular spring turkey season April 15 through May 5 were Franklin with 996 birds checked, Texas with 879, and Callaway with 710.

This year's spring turkey season was the safest on record, with only one firearms-related hunting incident reported. That incident was nonfatal and occurred during the regular season.



BALD EAGLE: NOPPADOL PAOTHONG

## WHAT IS IT?

### Green Treefrog

*Hyla cinerea*

On Page 1 and left is a green treefrog. Green treefrogs have round adhesive pads on all digits and have a body length of about 1 ¼ to 2 ¼ inches. They primarily live in the swamps, sloughs, and oxbow lakes of southeastern Missouri. Males chorus in the evenings from May to early August; together, they sound something like distant Canada geese. Females lay 500–1,000 eggs in June or early July and often produce more than one clutch per season. Eggs hatch in 2–3 days, and the tadpoles transform into froglets between late June and early September. Green treefrogs eat insects, which helps to keep those populations in check. On the other hand, this frog becomes food for other predators such as birds, snakes, and mammals. —*photo by Jim Rathert*

(continued from Page 7)

Hunting conditions were far from ideal, with frequent rain and below-average temperatures during much of the three-week season. In central Missouri, nighttime low temperatures averaged about 10 degrees colder than in 2012. The same weather station in Boone County reported approximately 1.5 inches more rainfall during this year's spring turkey season than in 2012.

Jason Isabelle, a resource scientist who

oversees turkey management for the Missouri Department of Conservation, says this year's increased harvest is the result of both improved turkey production and hunters' dedication.

"We knew from last year's field surveys that wild turkeys had the second year in a row of good production," says Isabelle, "so the outlook was pretty good going into the season. But you have to hand it to hunters for getting out there under

some challenging conditions. That just goes to show you how much enjoyment folks get from spring turkey hunting in Missouri."

Adding the harvest of 3,915 turkeys during this year's spring youth season April 6 and 7 brings the 2013 spring turkey harvest to 46,135. This is 1,335 more than in 2012, a 3-percent increase.

County-by-county spring turkey harvest totals are available at [mdc.mo.gov/node/263](http://mdc.mo.gov/node/263).

The Conservation Department's First Turkey Program lets turkey hunters commemorate their first turkey with a certificate suitable for framing. You can even add a photo of the proud hunter with his or her bird. To create a first-turkey certificate, visit [mdc.mo.gov/node/10469](http://mdc.mo.gov/node/10469). The same site has forms for a youth's first deer, as well as first deer/turkey certificates for adults.



Prairie chickens

## Prairie Chickens Get a Boost

A struggling flock of prairie chickens in Harrison County got a boost in April with the arrival of 34 prairie chickens from Nebraska. The hens were released at Dunn Ranch Prairie to bolster a flock that was hard hit by cold, rainy weather during their nesting season in recent years. Besides increasing the number of prairie chickens at Dunn Ranch, the new birds will provide a much-needed infusion of genetic diversity to the struggling flock.

Dunn Ranch is owned by The Nature Conservancy (TNC). Its 4,000 acres of remnant and restored native grasses and wildflowers make it the keystone property for restoring prairie chickens to the Grand River Grasslands Conservation Opportunity Area (COA). This tall-grass prairie restoration effort is a partnership of government and citizen conservationists in Missouri and Iowa.

Once home to hundreds of thousands of prairie chickens, Missouri now counts its isolated flocks of the birds in the dozens. Dunn Ranch had lost its native prairie chickens. The restored flock got its start when birds released as part of restoration efforts in southwestern Iowa crossed the state line to repopulate Dunn Ranch. As many as 60 prairie chickens inhabited Dunn Ranch a few years ago, but recently their numbers dwindled to fewer than 10.

Recently 16 hens were released as part of Missouri's reintroduction work. The newly arrived birds carry radio transmitters that will enable biologists to monitor the hens' movements. TNC managers use grazing by bison and prescribed burning to provide the variety of habitat types prairie chickens need.

Dunn Ranch is adjacent to the Conservation Department's 476-acre Pawnee Prairie Natural Area, which is another critical piece of the 70,000-acre grasslands COA.

## Two Record Fish Caught

Missouri recorded two fishing records in less than two weeks this spring. Joshua Ross, Cedar Hill, was snagging on the Meramec River in Jefferson County March 23 when he hooked a 1-pound, 14-ounce gizzard shad. The fish tied the existing alternative-methods record set by Brian Taylor, Poplar Bluff, on Jan. 9 on the Black River. Chris Kimble of Thomas, Okla., shot a 35-pound, 9-ounce longnose gar while bowfishing on Bull Shoals Lake April 5. The previous alternative-methods record was 34 pounds, 7 ounces. More information about Missouri fishing records and the Master Angler Award program is available at [mdc.mo.gov/node/2476](http://mdc.mo.gov/node/2476).

## CWD Update

The latest round of testing in February found four more cases of chronic wasting disease (CWD) in free-ranging deer. The good news is that all four came from the 29-square-mile CWD Core Area in Linn and Macon counties where the first case of CWD in free-ranging deer was detected in 2012.

The new cases bring the total confirmed CWD cases in Missouri's free-ranging deer herd to 10, all from the Core Area. The Conservation Department tested 3,225 deer statewide for CWD last year, including 196 from the CWD Core Area and 1,783 from the larger CWD Containment Zone consisting of Adair, Chariton, Linn, Macon, Randolph, and Sullivan counties. MDC has tested more than 38,000 deer for the disease since 2001.

## DID YOU KNOW?

*We work with you and for you to sustain healthy wildlife.*

### Wildlife Damage Management

- » **The Wildlife Damage Management program** provides technical advice to landowners experiencing wildlife conflicts. This is done through phone calls, mailings, workshops, and on-site visits.
- » **4,600 landowners annually** are served by this program.
- » **7,790 Missourians participated in 89 workshops** given by wildlife damage biologists on trapping and damage prevention.
- » **The program maintains partnerships** with other agencies and groups including the Missouri Trappers Association, USDA/Animal and Plant Health Inspection Service—Wildlife Services, Missouri Department of Agriculture, Missouri Department of Natural Resources, and the USDA Forest Service.
- » **For wildlife damage assistance**, see Page 3 for regional office phone numbers or visit [mdc.mo.gov](http://mdc.mo.gov) and search for your county under “Local Contacts” to find the wildlife damage biologist or conservation agent near you.
- » **To learn more about controlling nuisance animals**, visit [mdc.mo.gov/node/2573](http://mdc.mo.gov/node/2573).

“Our extensive CWD testing indicates we caught the disease while it is still limited to a small number of deer in a very concentrated area,” says MDC State Deer Biologist Jason Summers. “We hope that by reducing deer numbers in the Core Area, we can remove those with CWD. This will help reduce the spread of the disease to other deer in the area or at least slow the spread to other areas of Missouri.”

For more information about CWD in Missouri and what you can do to help contain it, see [mdc.mo.gov/node/16478](http://mdc.mo.gov/node/16478).

### Emerald Ash Borer Questions Answered

By now, many Missourians know that all ash trees in forests, suburban yards, and urban landscapes are threatened by a handsome green insect called the emerald ash borer (EAB). However, most of us still have questions about the threat. That’s why the Missouri EAB Program recently came out with five Frequently Asked Questions (FAQs) brochures. Separate brochures focus on the concerns of homeowners, wood-products industries, firewood producers/users, cities and towns, and general audiences. The publications are available at [eab.missouri.edu](http://eab.missouri.edu) under “FAQs.”

### Bear Research Update

Missouri is home to approximately 225 black bears. Four breeding populations exist in a 10-county area of south-central Missouri. Female bears den earlier than males, and some bears found in Missouri today probably are remnants of the state’s historic bear population, rather than recent arrivals from Arkansas.

Those are a few of the insights emerging from ongoing studies to gather detailed information necessary to manage a growing bear population wisely. The work includes capturing and tagging bears, fitting them with radio tracking collars, and even attaching video cameras to see what they eat and what they do. Biologists also are using bear DNA to unlock secrets about where Missouri’s bears came from. These studies are helping answer important questions, such as:

- Where do Missouri bears live?
- How widely do they range?
- What do they eat?
- When do cubs leave their mothers, and how far do they go?
- When and where do bears den?
- Is Missouri’s bear population growing?
- How can Missourians avoid conflicts with bears?
- Can carefully regulated hunting be useful in reducing conflicts?

Missourians care about conserving forests, fish, and wildlife, but sometimes fascination with bears overrides common sense. Deliberately feeding bears, failing to secure pet or livestock feed, or trying to lure bears close enough for photos all can rob bears of their natural fear of people and result in conflicts. The number of complaints about nuisance bears has increased in recent years. Most of these situations could be avoided by denying bears access to food or garbage. For more information on black bears in Missouri, including the research project, sightings, and preventing and dealing with black bears around potential food sources, visit [mdc.mo.gov/node/973](http://mdc.mo.gov/node/973).



Biologists fit black bears with radio tracking collars in order to learn more about their range in Missouri.

# Missouri River Restoration

Conserving fish and wildlife habitat along  
America's longest river

by NEIL BASS and MARK BOONE

## Columbia Bottom Conservation Area

Located in St. Louis County, this 4,318-acre area is at the confluence of the Missouri and Mississippi rivers and is owned and managed by the Conservation Department. The Corps funds management and habitat development at the site for projects that comply with the goals of the Corps' mitigation efforts. Restoration of bottomland hardwood forests, prairies, and shallow wetlands is ongoing. There are 120 acres of bottomland hardwood forest involved in this project, and 350 acres of prairies have been planted. The Recovery Program funds a pump station that delivers water to 800 acres of shallow wetlands. The area has frontage on both the Missouri and Mississippi rivers, totaling 6.5 miles and includes 800 acres of bottomland forest and a 110-acre island. Guest facilities include a visitor center, hiking trails, a boat ramp, and a viewing area. Find more information at [mdc.mo.gov/a9736](http://mdc.mo.gov/a9736).



**I**MAGINE WHAT THE MISSOURI RIVER was like just a few hundred years ago. It was a wide, untamed river with multiple channels, sloughs, backwater areas, and wetlands. Frequent flooding of the nearby land caused the channels to move and change with an endless number of shifting sandbars. Snags, or downed trees, and logjams were common. The river gained the nickname “The Big Muddy” because, well, it was muddy, carrying large amounts of sediment downstream.

Multiple channels, a variety of depths, and an abundance of trees and logjams provided a tremendous amount of diverse aquatic habitat.

Wetlands, prairies, and forests were commonplace on the surrounding lands. Fish and wildlife communities flourished in and near this natural, wild river.

Imagine the life of a riverboat captain. Multiple channels that changed with nearly every flood were a constant challenge, and there was no defined channel. Maps were typically inaccurate and not very useful. No GPS. The snags and shallow areas complicated river travel and left stretches of the river in Missouri littered with the wrecks of paddlewheel boats.

Now imagine what life would have been like for people living near the river. Frequent flooding made life challenging. The shifting channel sometimes left entire towns isolated from the river commerce on which they depended. These features did not endear the river to those interested in the westward expansion of a rapidly growing nation.



### Lower Hamburg Bend Conservation Area

Located in Atchison County, the Corps purchased the land as part of the Recovery Program. The entire area is owned by the Corps. The Conservation Department manages the 2,465-acre Missouri portion, with the balance of the area located in Iowa. The area is managed for a variety of wildlife habitat including bottomland forest, warm-season grass plantings, and wetlands. A 2-mile-long side channel and a 500-acre island are also important habitat features. Find more information at [mdc.mo.gov/a9911](http://mdc.mo.gov/a9911).

### Safety Gains and Habitat Loss

Beginning in 1912, the U.S. Congress directed the U.S. Army Corps of Engineers (Corps) to make the river easier and safer to navigate and to protect the adjacent lands from flood-



Trumpeter swans

NOPPADOL PAOTHONG



ing. This program eventually became the Bank Stabilization and Navigation Project. The river was narrowed and deepened following the construction of dikes and other structures, dredging and stabilizing the riverbanks to keep them from eroding and meandering. Ultimately, the Corps built, and still maintains, a self-scouring, 9-foot-deep, 300-foot-wide, 2,321-mile-long navigation channel from Sioux City, Iowa, to the Missouri's confluence with the Mississippi River near St. Louis. Since the early 1900s, Congress has invested more than \$35 billion (in today's dollars) on the Missouri River's navigation channel, its mainstem reservoirs, and flood control projects along the river.

The benefits of the Bank Stabilization and Navigation Project were many, but the environmental cost was high, eventually resulting in the loss of 522,000 acres of water and land habitat; two-thirds of these acres were in Missouri. It was this environmental damage that led Congress to authorize the Missouri River Fish and Wildlife Mitigation Project in 1986. The Mitigation Project was authorized to purchase, from willing sellers, 166,750 acres in the Missouri River floodplain below Sioux City. The project was designed to restore fish and wildlife



### Eagle Bluffs Conservation Area

This area in Boone County consists of 4,431 acres owned and managed by the Conservation Department. The area has 17 wetland pools totaling 1,100 acres of shallow wetlands, moist soil marshes, and emergent marshes. Water from the City of Columbia's wastewater treatment plant is routed through these wetlands, providing a reliable water supply and habitat for migrating birds and resident wildlife, and recreational opportunities. The Corps provides funds to assist in meeting the goals of their mitigation efforts on this area. One example is the installation of a structure that allows fish to move in and out of a wetland so it functions like a natural backwater, providing important fish spawning and nursery habitat. The area includes more than 10 miles of stream frontage along the Missouri River and Perche Creek. Find more information at [mdc.mo.gov/a6415](http://mdc.mo.gov/a6415).

habitats, while retaining the Corps' missions of navigation and flood damage reduction.

The pallid sturgeon was listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) in 1990. In 2000, the USFWS published a Biological Opinion concerning the pallid sturgeon that established the need to improve habitat. This helped further the Mitigation Project, allowing sites to be constructed for the benefit of this ancient and now rare fish. In 2007, all these efforts were combined into a single program called the Missouri River Recovery Program.



### H. F. Thurnau Conservation Area

Located in Holt County, the area is managed to preserve unique old fields, grasslands, bottomland forests, wetlands, and other habitats associated with the Missouri River and to provide recreational opportunities for the public. The area is comprised of 366 acres owned by the Conservation Department and 1,362 acres owned by the Corps; the latter acreage was purchased through the Recovery Program. The area is located between the Tarkio and Missouri rivers in northwest Missouri and has 4.2 miles of river frontage. A boat ramp provides access to the Missouri River for anglers and boaters. There is also a primitive campground on the area. Find more information at [mdc.mo.gov/a6415](http://mdc.mo.gov/a6415).

Once land is acquired through the Recovery Program, habitat restoration plans are developed in coordination with the general public, local levee and drainage districts, and state and federal agencies, including the Department of Conservation. Projects include work in bottomland forests and grasslands and riverine and wetland areas. Shallow-water habitat is critical for pallid sturgeon recovery and is defined as side channels, backwater areas, sandbars detached from the bank, and low lying areas adjacent to the bank. Much of riverine restoration is focused on these areas. Wetland features that are being restored or created include scour holes, oxbows, and other wetland types.

Reconnecting the main channel of the river to side channels, backwaters, and the floodplain is another goal of habitat restoration on the Missouri River. Recent research suggests that overbank flooding is important because it causes an increase in invertebrates (insects, worms, crayfish, etc.), which are an important part of the river's food chain. Two methods used for floodplain reconnection are opening levees and levee setbacks on mitigation lands. This provides for a dynamic habitat that is beneficial for fish and wildlife and provides additional outdoor recreation opportunities that are not available on other areas.

### Recovery Program Accomplishments

Accomplishments over the past 27 years under these restoration programs include the purchase of more than 63,000 acres from willing sellers in Iowa, Kansas, Missouri, and Nebraska. Restoration efforts have resulted in substantial gains in shrub lands (167 percent), grasslands (119 percent), forest (24 percent), and wetlands (13 percent). In Missouri, approximately 31,000 acres have been acquired at 28 sites in 16 of the 25 river counties. The Department of Conservation manages 10,274 acres of this land for the Corps. Other benefits to habitat restoration include enhanced opportunities for the public to use and enjoy



## Missouri River Fish and Wildlife Mitigation Sites

- |                    |                     |                                       |                              |
|--------------------|---------------------|---------------------------------------|------------------------------|
| 1—Confluence Point | 8—Eagle Bluffs      | 15—Bakers Bend                        | 21—Wolf Creek Bend           |
| 2—Cora Island      | 9—Rocheport Cave    | 16—Baltimore Bend                     | 22—Rush Bottom Bend          |
| 3—Columbia Bottoms | 10—Overton Bottoms  | 17—Bootlegger Bend                    | 23—Thurnau Addition          |
| 4—Berger Bend      | 11—Cambridge Bend   | 19—Kickapoo Island<br>and Weston Bend | 24—Hemmies Bend/Corning Site |
| 5—Heckman Island   | 12—Grand River Bend | 19—Worthwine Island                   | 25—Deroin Bend               |
| 6—Tate Island      | 13—Grand Pass       | 20—J and O Hare Wildlife Area         | 26—Apinwall                  |
| 7—Providence Bend  | 14—Tammerlane Bend  |                                       | 27—Nishnabotna               |
|                    |                     |                                       | 28—Lower Hamburg             |

these lands for hunting, fishing, boating, hiking, wildlife viewing, and other outdoor pursuits.

Missouri River public uses studies have shown that the lower river receives 2.5 million annual visits, which equals 8 million recreational hours spent each year on or adjacent to the river. Users are engaged in more than 71 different activities, with sight-seeing (29 percent), fishing (24 percent), and boating (12 percent) making up the top three. The 2004–2005 public use study of the lower Missouri River showed that this provides annual economic benefit of \$39.1 million (in 2004 dollars).

Partnerships and quality resource management, guided by new research and increased knowledge, will ensure the continued success of the Recovery Program. Our combined efforts

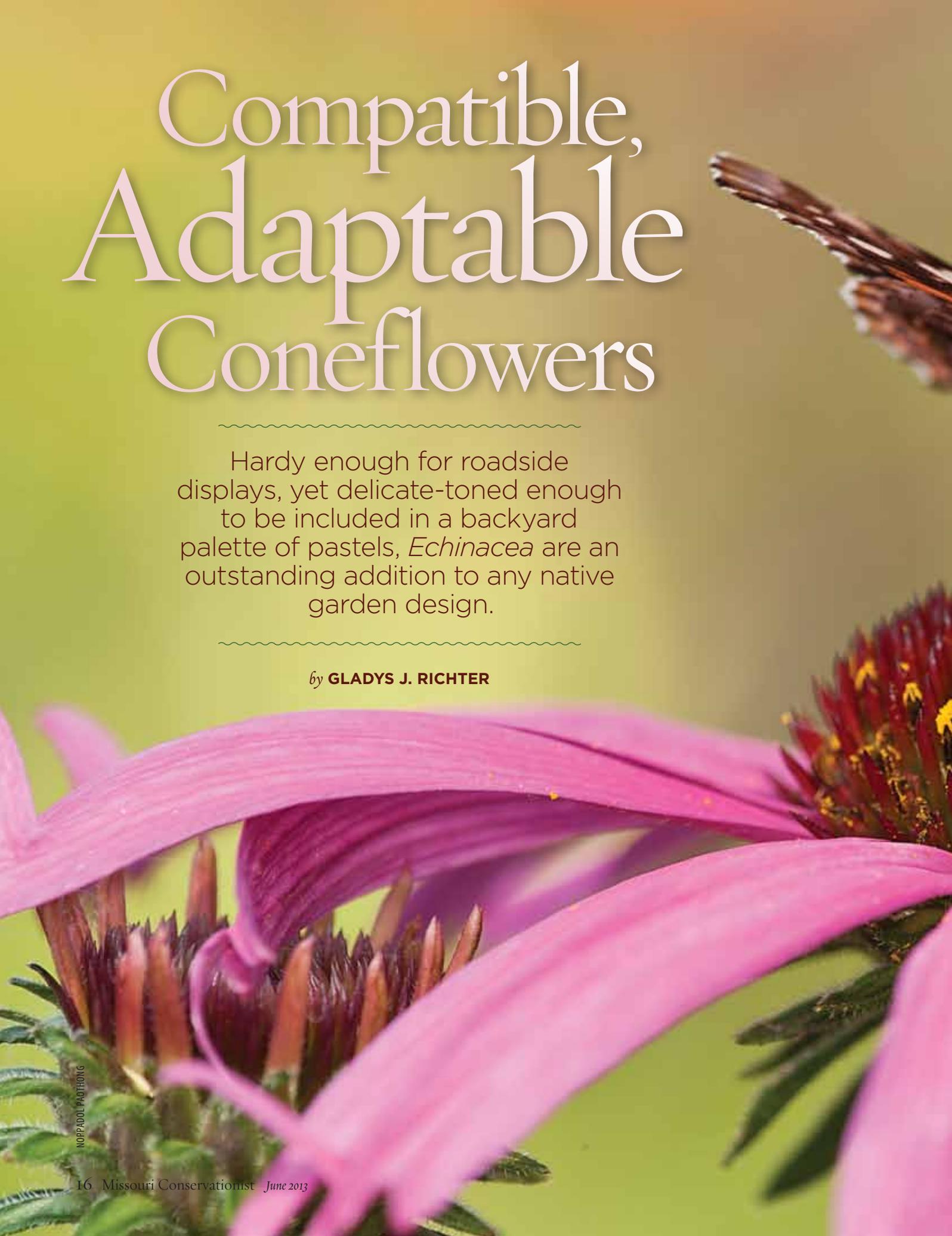
will further enhance Big Muddy for the benefit of its natural features and communities and the citizens who enjoy our nation's longest river.

Additional information on the Missouri River Recovery Program and the Missouri River Fish and Wildlife Mitigation Project can be found at [moriverrecovery.org](http://moriverrecovery.org). To find information on conservation areas on the river, visit the MDC Atlas Database at [mdc.mo.gov/atlas](http://mdc.mo.gov/atlas). ▲

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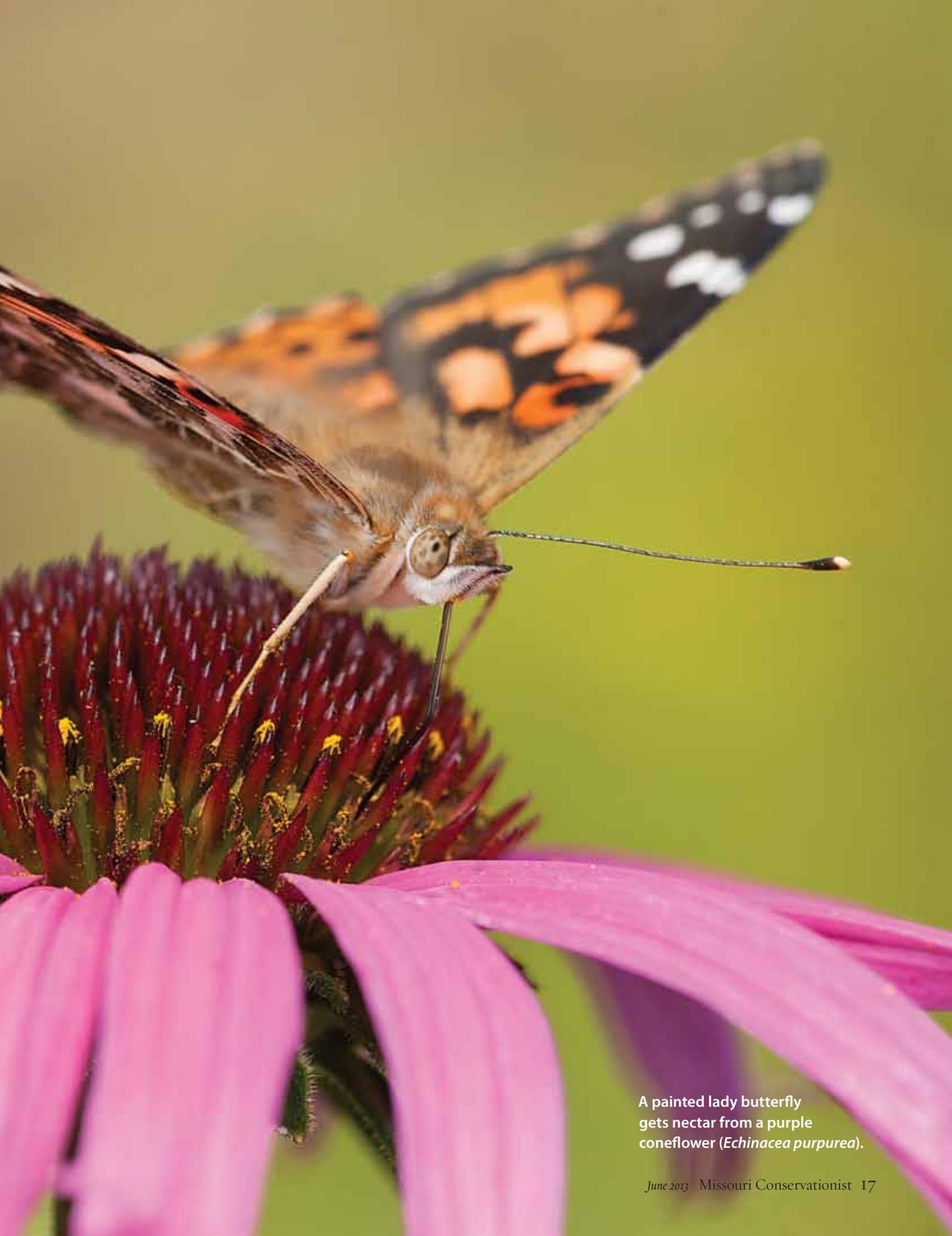
*Neil Bass has been a federal biologist for more than 15 years and works for the US Army Corps of Engineers on the Missouri River Mitigation Project. Mark Boone recently retired from the Conservation Department after serving as the first big river specialist since April 2010. He spent most of his 26-year career as a fisheries management biologist.*

# Compatible, Adaptable Coneflowers



Hardy enough for roadside displays, yet delicate-toned enough to be included in a backyard palette of pastels, *Echinacea* are an outstanding addition to any native garden design.

by **GLADYS J. RICHTER**



A painted lady butterfly gets nectar from a purple coneflower (*Echinacea purpurea*).

**A LITTLE MORE THAN 200 YEARS AGO,** William Clark wrote in his travel journal, “I collected a Plant the root of which is a Cure for the Bite of a mad dog & Snake which I shall Send [to President Jefferson].” This amazing plant was our narrow-leaved purple coneflower, *Echinacea angustifolia*.

*Echinacea* are still often touted as medicinal in nature. Historically, coneflower potions have been used to treat such ailments as anthrax, blood poisoning, snake bites, skin infections, and the common cold. Due to their reputation, coneflowers have been referred to by other names, such as snakeroot and black sampson. In the 1700s, horses suffering from saddle sores were treated with an extract obtained from coneflower roots. However, this genus of nine distinct native species found in the United States is also highly valued for its splendid summer coloration, attractiveness to wildlife, hardy nature, and ease of cultivation.

### Lovely and Local

The name *Echinacea* is derived from the Greek word echinos, or hedgehog, in reference to the flowers’ large, brown, cone-shaped seedheads that resemble the prickly spines of a frustrated hedgehog. Below the angry hedgehog portion are long, narrow, swept-back petals, which often appear as flowing skirts when blown about by warm summer breezes.

Coneflowers display a wide range of colors, depending upon the species and the genetic variation afforded by crosses that occur readily among *Echinacea*. White, orange, and brilliant magenta hues develop when the genetic pool varies. Because coneflowers are native to many areas, growing them can be a snap, even upon rocky glade habitats, during times of drought, or under other adverse weather conditions.

### Five Sister Species

It is hard to pass by a garden filled with the brightly colored petals of purple coneflowers without stopping and marveling. One of five *Echinacea* species found in Missouri, purple coneflowers are a wildflower favorite among gardeners and landscape designers. Growing between 24 and 36 inches tall, *Echinacea purpurea* sports robust, dark brown flowerheads



**Because coneflowers are native to many areas, growing them can be a snap, even upon rocky glade habitats, during times of drought, or under other adverse weather conditions.**

with pinkish-purple to reddish-purple petals and broadly ovate, dark green leaves. Occasionally, due to genetics, a rare form with white petals appears among the mixed myriad of purples and pinks within stands of this species.

Found in habitats such as upland prairies, sun-dappled openings in wooded forests, along stream banks, roadsides, and abandoned pas-



Glade coneflowers (*Echinacea simulata*)



ture lands, purple coneflowers occur naturally in all areas of Missouri except in the western edge of the Glaciated Plains and in the Mississippi Lowlands region of the state.

While purple coneflowers require soils with some moisture, others coneflowers such as *Echinacea simulata*, or glade coneflower, thrive upon the harsh, dry barrens, bald knobs and ridges typically found in the Ozarks region.

Absent from most of Missouri, except for the southeastern corner of the state and Dunklin County in the Bootheel, glade coneflowers enjoy life in the sun. Growing where many plants would shrivel up and die due to dry,

GLADE CONEFLOWERS: DANNY BROWN

**When in full bloom, the fresh white pollen of pale purple coneflowers is carried from plant to plant on the tiny feet of bees, butterflies, and other pollinating insects.**

harsh conditions, this species is at home upon Missouri's sun-bathed limestone and dolomite glades, savannas, and bluff tops. Similar in appearance to pale purple coneflower, glade coneflowers display pink flowers in a shade intermediate between purple coneflower and pale purple coneflower. Habitat preference and bright lemon-colored pollen help to set this species apart from its relatives.

Pale purple coneflower, *Echinacea pallida*, which is usually lighter in color than purple coneflower and glade coneflower, is considered the most widespread *Echinacea* in Missouri. Like most coneflowers in our state, it is absent from the Bootheel region. Pale purple cone-

**Learn more** about Missouri's native coneflowers and other species through our online field guide at [mdc.mo.gov/node/73](http://mdc.mo.gov/node/73).

flower is slender in all respects, but is far from being a shrinking violet. Flowerheads with light pink to nearly white petals sit proudly atop 30- to 36-inch-tall stiff stems adorned with only a few long, narrow, rough-textured leaves. When in full bloom, the fresh white pollen of this species is carried from plant to plant on the tiny feet of bees, butterflies, and other pollinating insects.

*Echinacea pallida* prefers dry, sunny habitats such as glades, rocky savannas, native upland prairies, roadsides, and railroad right-of-ways. Occasionally, outdoor enthusiasts who happen upon an old pasture, field, or wooded clearing may be delighted with a blooming population during a spring trek in late May into June. There is nothing quite like a warm, gentle spring breeze, the rhythmic melody of songbirds, and a patch of butterfly-adorned coneflowers to sooth your senses.

Another Missouri coneflower species often sought by herbal collectors is yellow coneflower, *Echinacea paradoxa*. With vibrant yellow sun-ray petals and deep brown, bristly cone centers, the yellow coneflower showcases a dramatically different color scheme than that of its purple and pink cousins.

Endemic to the Ozarks, bright yellow coneflowers may be found primarily growing upon dry dolomite and limestone glades and savannas and occasionally roadsides, especially where a highway cuts through a limestone or dolomite hillside or bald knob.

June is the perfect time of year to check out this spectacular 1- to 3-foot-tall wildflower while taking a hike along a designated trail such as those within Caney Mountain Conservation Area in Ozark County. Here, yellow coneflowers may be found growing in association with other glade wildflowers and prairie grasses. As the summer sun beats down upon the bald knobs and rocky summits of the glade, field sparrows, prairie warblers, and collard lizards dart amidst the maze of sparse vegetation, hardy wildflowers, and dolomite stones.

Pale purple coneflower (*Echinacea pallida*)





JIM RATHERT

Yellow coneflowers (*Echinacea paradoxa*)

## Poach Not, Want Not

It is probable that back in Captain Clark's day, all species of coneflowers were more abundant than they are today. Narrow-leaved coneflower, the species described in his historical travel journal, is found today growing naturally in Iowa, Nebraska, and Kansas. It is believed to have been introduced to our state and currently has a historical ranking in Missouri, with this coneflower being last documented by Viktor Muhlenbach in St. Louis County in the extreme eastern region of the state. Throughout North America it is uncommon to come upon the species, which prefers dry, rocky habitats adjacent to railroads. Adorned with pink flowers and bright yellow pollen, narrow-leaved Coneflower, *Echinacea angustifolia*, superficially resembles other pink to purple coneflowers. It is only with careful scientific examination of entire plants that positive identification can be made.

Because of their acclaim as herbal remedies, *Echinacea* are often pursued by unscrupulous plant poachers who seek to sell the roots in the black market herbal trade. The illegal digging of wild stands of coneflowers leaves its ugly mark upon the landscape and robs both wildlife and outdoor enthusiasts of the plants' outstanding qualities. Because of widespread abuse of Missouri's *Echinacea* and many other native wildflowers, laws protecting wild growing populations have been enacted which make it illegal to dig plants from our roadways and public lands.

### Tried and True Missouri Native Plants

Puzzled about which native plants will work best in your yard? Find the answer in *Tried and True: Missouri Native Plants for Your Yard*, which showcases more than 100 plants native to Missouri. In addition to colorful photos, this guide groups plants into sections that include vines, ferns, grasses and sedges, perennials, shrubs and trees, both large and small, and makes it easy to locate plants that fill a specific need. There also are tips for getting started with

native plants and a chart that suggests native plant alternatives for frequently used yard plants. With a little planning, you'll have flowers blooming from very early spring until late fall. Perhaps more importantly, you will be creating a habitat that feeds and shelters desirable wildlife. Available for \$6 from Department of Conservation Nature Shops and online at [mdcnatureshop.com](http://mdcnatureshop.com).



Narrow-leaved coneflowers (*Echinacea angustifolia*)

**Because of their acclaim as herbal remedies, *Echinacea* are often pursued by unscrupulous plant poachers who seek to sell the roots in the black market herbal trade.**

*Echinacea*, like all of our wildflowers, should never be dug from wild populations. Due to root structure and environmental nutrient associations, many native plants do not survive the stress of such a move. For those desiring coneflowers of their own, several of today's nurseries carry not only *Echinacea* seed, but also first- and second-year perennial plants for your personal native garden collection.

Spring and early fall are the best times to work on a perennial bed of coneflowers. From seed, *Echinacea* take two years to bloom, but once established, perform delightful eye-catching displays for many years. They self-sow readily and also often produce offshoots that may be divided from the parent to grow into new independent plants.

### Team Players

Coneflowers are a great choice for large mass plantings and are garden compatible with a variety of our other native wildflowers, includ-



ing butterfly-weed, black-eyed susans, beard-tongues, and native prairie grasses. To keep native populations truly native it is a good idea to obtain seed or plants that are cultivated from the genetic pool found here, rather than from plants of other states.

Native coneflowers are an important piece in the natural environment puzzle, and they even help other species to thrive. Robber flies have been observed using coneflower heads as places to lay their eggs. As adults, regal fritillary butterflies depend upon coneflowers as a nectar source.

Listed on Missouri's Watch List, the regal fritillary is in danger of becoming extirpated in the state. Its population status throughout North America is also in peril, due to loss in quality prairie habitat. By preserving intact prairie lands abundant with wildflowers such

as *Echinacea*, the regal fritillary and other species have a better chance for survival.

*Echinacea* boast more than just pretty heads. Gardeners prize them for a long list of outstanding qualities, including their ability to attract butterflies and hummingbirds, durability as cut flowers, and appeal to native songbirds such as goldfinches that feast upon their seed heads during colder months.

Even after their summer color has faded away, their robust nature shines through during winter and adds architectural beauty to snow-adorned garden beds and borders. With all of their outstanding qualities, coneflowers are compatible with a variety of landscape designs and have a little of something for everyone. ▲

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*Gladys J. Richter is an interpretive freelance writer who lives near Richland, Mo.*

**Coneflowers are a great choice for large mass plantings and are garden compatible with a variety of our other native wildflowers. Spring and early fall are the best times to work on a perennial bed of *Echinacea*.**

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An excerpt from the Missouri  
Department of Conservation's  
cookbook *Cooking Wild*.  
To purchase, see Page 29.  
.....

# FISH

A world of good eatin' in the state's waters.

by **BERNADETTE DRYDEN**

I'LL NEVER FORGET SNEAKING MY FIRST BITE OF creamy white, golden-crust catfish from between the paper towels when I was 6 or 7 years old. My mother had just scooped it out of the frying pan before supper, but I couldn't wait until it got to the table. My uncle, an avid Cuivre River fisherman, kept our family's freezer stocked with catfish and carp. Consequently, I had many opportunities to repeat my stealthy behavior whenever the irresistible sizzling sounds and smells of frying fish wafted from the kitchen during my childhood. Since then I've enjoyed cooking and eating many more kinds of Missouri sport fish, but catfish with cornbread holds a special place in my heart.

With almost a million fishing permits sold in the state annually, it's obvious that fish rank high in the hearts and kitchens of many Missourians. Although there are more than 200 species of fish in the Show-Me State, anglers focus on only about two dozen of them. Bass, crappie, catfish, and trout — in that order — are the most popular. Although not a native species, trout stocked in the state's cold streams have drawn fly fishers from near and far. In fact, Missouri has become one of the top five trout-fishing spots in the nation.

Trout draw many anglers not only for their outstanding culinary possibilities, but also for the "auditory and visual vacation" fishing for trout provides. That's how

angler Theresa Ferrugia, who took up the sport eight years ago, describes her time in the water. "I love the sounds of the running water, the birds and the wind ... and seeing the eagles, osprey, kingfishers, hummingbirds, and flowers along the banks, rocks, and boulders. Of course, the colors of the fish themselves are gorgeous.

"Even though my husband and I go fishing together, most of the time we don't even fish within sight of each other. I really enjoy fishing by myself—the time passes so quickly. Boat fishing is not for me, because I love to wade. In the winter I use waders and boots, but in the summer I wet wade, using only boots. My passion is dry fly fishing, and the most challenging thing about it is what combination of colors to use, how to present the fly, and how the trout might be taking the fly on a particular day.

"I have seen the most amazing things while fishing — an eagle and an osprey fighting in midair over a fish; a guy running upstream because he just saw a bear cross the river; and three or four eagles soaring against the bluffs. It's all wonderful!"

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*Bernadette Dryden is a former editor and publications supervisor with the Missouri Department of Conservation. She grew up cooking next to her mother in High Hill, Mo., and has studied cooking in Mexico and Italy.*



# GRILLED TROUT STUFFED WITH TOMATO AND BASIL

Fire up the grill on one of those hot summer days, when tomatoes and basil are abundant at the farmers market or in your garden. Locally cured bacon makes this dish superb.

Serves 2 to 4

**2 whole trout (cleaned, boned, and butterflied)**  
**Extra-virgin olive oil**  
**Salt and freshly ground pepper**  
**1 medium red, dead-ripe tomato, sliced**  
**8 large fresh basil leaves**  
**2 tablespoons freshly grated Parmigiano-Reggiano cheese**  
**4 slices bacon**

» **Rinse** well both sides of fish and pat dry with a paper towel. On a baking sheet, place fish skin-side down, opening them flat like a book. Drizzle a teaspoon or so of olive oil over flesh of trout and rub in the oil. Sprinkle with salt and pepper. Place two slices of tomato on one half of the trout, topping each slice with two basil leaves. Sprinkle the length of the trout with 1 tablespoon cheese.

» **Fold** unadorned side of the fish over the other side and wrap the whole fish in a spiral fashion with bacon; two bacon slices secure a medium-sized trout nicely. Repeat procedure with the other fish. Grill or broil in oven until bacon begins to crisp and trout is cooked through.

» **Side** dishes that accompany nicely include fresh whole new potatoes; corn on the cob; green beans; cucumber, onion and sweet red-pepper rings in an herby vinaigrette; and crusty white bread. A glass of Pinot Grigio or Pinot Bianco doesn't hurt either.

## Canadian Cooking Theory

I swear by the Canadian Cooking Theory for cooking fish, and have used it all my cooking life to determine when fish are done. First publicized by the Department of Fisheries of Canada, the basic principle is that fish can be cooked, no matter how, at 10 minutes per inch. The technique works with whole fish, steaks and fillets, and it applies to baking, braising, broiling, frying, poaching, sautéing, grilling, steaming, and any other cooking method you can dream of. Measure your portion of fish at its thickest part (its depth, not across the fish), and calculate 10 minutes of cooking time for each inch of thickness. Having said all that, however, it is best to err on the side of under-cooking. Some people prefer their fish on the rarer side, so always inquire of your guests' preferences.



## Cooking Tip

A fish griller is perfect for this because it allows easy turning of the fish on the grill. If using a broiler, make sure fish is at least 5 inches from the broiler element.





# CATFISH TACOS WITH FRESH-TOMATO SALSA

Makes 4 to 6 tacos

**1 pound catfish fillets**  
**2 garlic cloves, minced**  
**3 tablespoons fresh lime juice**  
**Salt and coarsely ground pepper**  
**4 to 6 6-inch corn tortillas**  
**2 cups chopped Romaine lettuce**  
**1 avocado, cubed**  
**¼ cup feta cheese, crumbled**

*Bernadette's Fresh-Tomato Salsa*

» **Place** fish on lightly oiled, rimmed baking sheet. Mix garlic and lime juice and drizzle mixture over fish. Sprinkle with salt and pepper and let stand 15 minutes.

» **Broil** fish in oven (you also may grill it) until opaque in center, 6 to 8 minutes. While fish is cooking, warm tortillas directly on a burner over lowest heat, turning once, until heated through. Watch carefully; the first side needs only 20 seconds or so, and the second side even less time. Alternatively, you may heat tortillas in a pan. Keep them warm in a tortilla basket lined with a cloth towel or napkin.

» **Cut** fish into 1-inch pieces. Top each tortilla with lettuce, then fish. Drizzle with salsa and top with avocado and cheese. Serve with your favorite local ale.

## BERNADETTE'S FRESH-TOMATO SALSA

This makes enough to spice up a half-dozen tacos, plus some left over to have with tortilla chips the next day. You can throw it together in the time it takes to have someone else prep the ingredients for the tacos.

Makes about 4 cups of salsa

**4 to 5 garlic cloves, minced**  
**1 fresh jalapeno pepper, minced**  
**2 medium fresh sweet peppers (red, orange, yellow, or green or combination), diced**  
**½ to ¾ medium onion, diced**  
**5 to 6 medium tomatoes (a variety of colors and types), diced**  
**Several tablespoons finely chopped cilantro**  
**Juice of fresh lime**  
**Salt and coarsely ground pepper to taste**

» **Combine** all ingredients in a bowl and serve.

### Don't Measure, Just Taste!

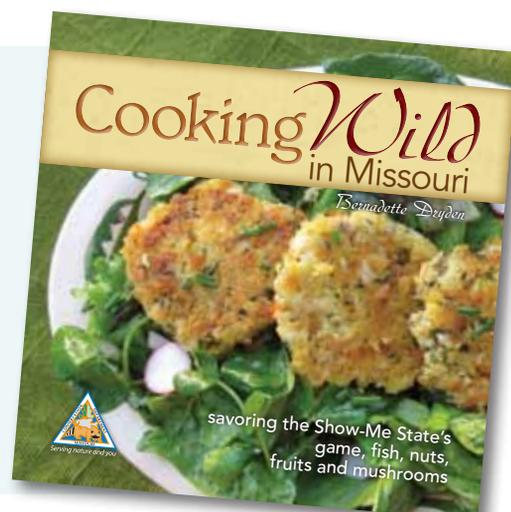
I never measure the ingredients for this salsa, and I suggest you don't either. Experiment with the quantities until you get the combination that tastes right for you. Always keep extra tomatoes on hand in case you need to add more to tone down the heat. I usually add the garlic and jalapeno sparingly if I'm serving people of whose tastes I'm uncertain. If I know everyone likes "hot" the way I do, I go whole hog and use lots of garlic and jalapeno. If fresh, local tomatoes are not in season, use canned. I love the chopped, fire-roasted varieties available in many grocery stores.

### Cooking Wild in Missouri

*Savoring the state's native fish, game, nuts, fruits, and mushrooms*

Whether you hunt, fish, or forage, Bernadette Dryden's collection of more than 100 delicious, kitchen-tested recipes highlights Missouri's game, fish, nuts, fruits, and mushrooms. Tempting recipes cover appetizers, fresh salads, savory stews, elegant entrées, and delectable desserts. Detailed instructions are suitable for the novice or advanced cook and offer imaginative, fresh ideas for turning your harvest into a mouth-watering feast. With beautiful color photographs on nearly every page and dozens of tips to make your time in the kitchen easy, efficient, and fun, *Cooking Wild in Missouri* is sure to earn a trusted spot in your kitchen.

It costs \$15 plus sales tax and shipping and handling. To order, call toll free 877-521-8632, or visit [mdcnatureshop.com](http://mdcnatureshop.com).



## Red-shouldered Hawk

*While this hawk's call may not be sweet, its flying skills are a treat to watch as it hunts a wide variety of prey.*

THE RED-SHOULDERED HAWK (*Buteo lineatus*) is one of my favorite Missouri raptors, not only for its beauty but its personality. If your property or favorite park has ever been host to one of these noisy hawks, especially during nesting season, you know what I'm talking about. The red shoulder's call is a loud "kee-ah" that is as distinctive as the call of a blue jay. Once I walked right under a red-shouldered hawk that was perching on a low branch and it admonished me with a series of squawks that would make an Amazon parrot proud! Intrepid, as red-shoulders often are around humans, it remained on the branch for a series of photographs before it returned to its business of plucking burrowing crayfish from the trail below.

If you are wondering why a hawk was eating crayfish, the red-shouldered hawk's affinity for a great variety of prey is another reason for my fascination with the species. A few summers ago, I watched a red-shoulder feeding on newts and frogs at our pond. At one point it was half-submerged in the water, trying to hop out of the mud with a green frog secured in one of its talons. Soaked and muddy, the frustrated hawk finally made it to dry ground with its catch.

Although the red-shouldered hawk doesn't have the dazzling songbird acquisition skills of the Cooper's hawk, it will take birds from the ground when the opportunity arises. Last winter, I watched a red-shoulder as it sat in a cedar tree in our front yard, glaring at a flock of grackles beneath our bird feeder. Finally, it swooped down and made a half-hearted attempt at one of the black birds, not even coming close to a kill. I commented to my wife that the poor hawk should be hunting voles if it didn't expect to go to bed hungry. About five minutes later, we made another check out the window to find the same individual tearing the feathers off an unfortunate grackle!

As much as I enjoy the antics of the red-shouldered hawk, I'm also impressed by its beauty. Its barred chest is similar in color to that of a robin and its shoulders are reddish-orange, hence the name. Note the rusty-colored shoulders of the individual in the featured photograph. I captured the image as the hawk was descending on a vole at Shaw Nature Reserve in Franklin County.

The red-shouldered hawk can be found throughout Missouri but it is rare in the northwestern part of the state. Red-shouldered hawks build a nest of sticks high in a tree, usually close to a stream or river. If you ever get a chance to observe a nesting pair of red-shoulders, you will be amazed at the variety of food items they bring to their nestlings. I observed a nest for several weeks one spring and I watched the chicks feast on salamanders, frogs, mice, snakes, and other items I didn't even recognize. It was an experience I'll never forget.

—*Story and photos by Danny Brown*

📷 (main photo) 500mm lens + 1.4 teleconverter • f/5.6 • 1/640 sec • ISO 400

📷 (insert) 500mm lens • f/4.0 • 1/100 sec • ISO 400

*We help people discover nature through our online field guide. Visit [mdc.mo.gov/node/73](http://mdc.mo.gov/node/73) to learn more about Missouri's plants and animals.*





## Davisdale Conservation Area

*Discover the many facets of this area's natural Missouri roots, including forests, loess hills, prairies, and bobwhite quail.*

THIS HOWARD COUNTY conservation area (CA) showcases a distinctive combination of Missouri landscapes. While more than half of its 2,701 acres are forested, Davisdale CA blends traditional Missouri forest and woodlands with grassland, prairie, rugged loess hills, and more than 800 acres of river-hills woodland including pecan and walnut trees.

A bit of local history accompanies the area's natural-landscape diversity, with at least three Indian mounds present on the property.

Amid the various types of land cover is a series of scenic limestone bluffs carved by the Missouri River, which now flows 1.5 miles away from the bluffs. Along with the river are 16 lakes or ponds with fishing opportunities for bass, catfish, and sunfish.

In addition to fishing, the area also offers outdoor recreation opportunities for bird watching, primitive camping, hiking, hunting, and trapping with special-use permits. Although there are no designated trails, area access trails are available for hiking, as well as a portion of the Katy Trail that runs along Davisdale CA's southern boundary. Hunting prospects include deer, dove, quail, rabbit, squirrel, and turkey in their respective seasons.

Davisdale CA is a quail emphasis area, so it is managed especially to maintain early-successional habitat specific to the needs of bobwhite quail. Practices such as brush-pile construction and edge feathering provide good escape cover for these birds. Significant acres of woodlands have recently been thinned and are being managed with pre-



500mm lens +2.0x teleconverter • f/8 • 1/200 sec • ISO 400

scribed fire to increase plant diversity. Lucky visitors might spy hidden quail broods as chicks begin to hatch this summer.

Other management practices at Davisdale CA work to conserve soil quality. Techniques including contour terraces, catch basins, limited tillage, and crop rotation continue the traditional practices of early settlers in the area. A variety of crops are planted in rotation on about 300 acres, and grain is not harvested to leave winter food for wildlife. Legume and native-grass plantings help control erosion and replace less desirable grasses such as tall fescue.

Davisdale CA is located 15 miles west of Columbia and 7 miles east of Boonville on Highway 40, which can be reached from Interstate 70. As always, visit the area's website (listed below) for further information including an area map and brochure.

—Rebecca Maples, photo by Noppadol Paothong



**Recreation opportunities:** Bird watching, fishing, hiking, hunting in season, primitive camping, trapping with special-use permits

**Unique features:** This area features a distinctive combination of Missouri landscapes including forest, grassland, prairie, and rugged loess hills. Davisdale CA is a quail emphasis area managed especially for bobwhite quail habitat.

**For More Information** Call 573-815-7900 or visit [mdc.mo.gov/a8229](http://mdc.mo.gov/a8229).

# Kids in Nature



Simple Ideas  
for Family Fun

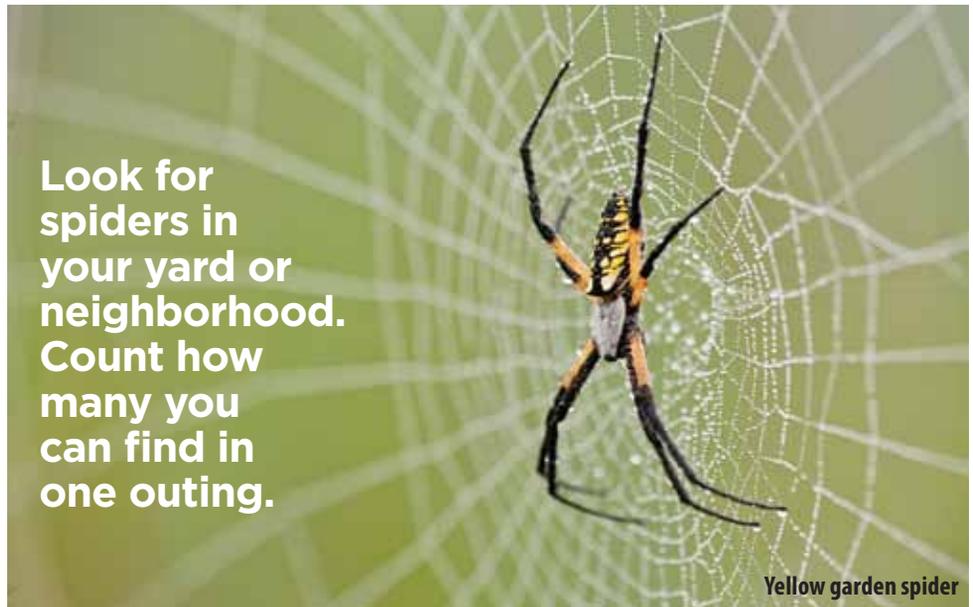
Look for **purple coneflowers** blooming on prairies and roadsides. To attract butterflies and birds, plant a purple coneflower in your yard.



Watch fireflies in the evening. Fireflies, or **lightning bugs**, are flying beetles that emit light from their lower abdomens. Each species of firefly has a different flashing light pattern. See how many different patterns you can see.

Look under a log or rock to see what lives there.

Look for spiders in your yard or neighborhood. Count how many you can find in one outing.

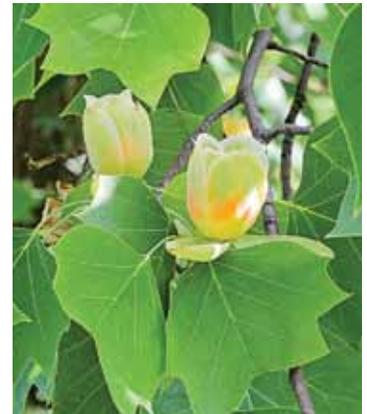


Dig for worms. Go fishing and use a worm to bait your hook.



Try to attract a Baltimore oriole to your yard. Put out a dish of grape jelly. Be sure to replace the jelly every couple of days to keep germs from growing in it. Orioles also like oranges. Cut an orange in half and set it outside.

Find a **tulip poplar tree** and enjoy its yellow flowers during the first part of the month.



## Kids in Nature Photo Contest!

Break out those cameras and send us your best images of you and your family enjoying the outdoors for our new photo contest. Once again, we will be accepting entries via the online photo sharing service, Flickr. If you are not a member of Flickr, it is easy and free to join. Once you are a member, just navigate to our kids in nature group page: [www.flickr.com/groups/mdc-kids-in-nature](http://www.flickr.com/groups/mdc-kids-in-nature) and submit your photos. MDC staff will select a winner every month and display it on our website. All of the monthly winners will appear in the January 2014 issue of the magazine.



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## I Am Conservation

Keith and Maura Harris recently installed a reinforced stream crossing on their property near Neosho, Mo. Baynham Branch is a perennial stream that runs through their property and eventually feeds into Shoal Creek, one of southwest Missouri's larger rivers, and a source of drinking water for the city of Joplin. The crossing they installed will significantly reduce sediment input to the stream that would normally occur every time agricultural equipment crossed over. "We're trying to work with nature, not against it," said Keith. The couple was able to tap into both state and federal cost share programs to help offset the cost of the crossing, which opened up 40 acres of their land to forest management that was otherwise inaccessible. "This voluntary practice shows the Harris' stewardship ethic, their commitment to maintaining clean water, and their intent to reduce sediment inputs that could be detrimental to aquatic organisms," said Missouri Department of Conservation Forestry District Supervisor Nate Forbes. "This type of conservation practice has applicability to the greater agricultural community across the state, where running water limits access to pastures and crop fields." Keith said he and his wife want to leave their farm a better place than when they found it. "We like to think of what we're doing here as basic homesteading," he said. "If we can manage our farm well, work with our timber, raise some stock, and make the farm productive, we're living a healthy lifestyle." —*photo by Noppadol Paothong*